

WHAT IS CLAIMED IS:

1. An impact-absorbing, load-limiting connection device, comprising:
 - a first connection structure;
 - a second connection structure, at least one of the first and second connection structures being moveable with respect to the other in a predetermined direction of movement corresponding to an anticipated main impact direction;
 - a guiding mechanism configured to guide at least one of the first and second connection structures along the direction of movement, the guiding mechanism including at least one transverse force-absorbing guide element configured to absorb a force in a direction transverse to the direction of movement; and
 - at least one impact-absorbing, load-limiting sacrificial element disposed between the first connection structure and the second connection structure and uncoupled from a transverse load path of the transverse force-absorbing guide element, wherein the sacrificial element is configured to be deformed and destroyed by a relative movement between the first and second connection structures in the direction of movement upon application of a predetermined maximum load.
2. The connection device as recited in claim 1, further comprising at least one fastening element having a predetermined holding power connecting the first and second connection structures, the at least one fastening element preventing the relative movement upon application of a load that is less than or equal to the predetermined holding power and allowing the relative movement upon application of a load that is greater than the predetermined holding power.
3. The connection device as recited in claim 1, further comprising at least one holding element configured to keep the sacrificial element in an essentially unloaded state upon application of a load that is less than or equal to the predetermined maximum load.
4. The connection device as recited in claim 1, wherein the sacrificial element is tubular.

5. The connection device as recited in claim 1, wherein the sacrificial element is a triggered tubular sacrificial element.

6. The connection device as recited in claim 4, wherein the tubular sacrificial element includes a fiber composite material.

7. The connection device as recited in claim 6, wherein the fiber composite material is wrapped.

8. The connection device as recited in claim 1, wherein the transverse force-absorbing guide element extends inside of the sacrificial element.

9. The connection device as recited in claim 1, wherein the transverse force-absorbing guide element surrounds the sacrificial element.

10. The connection device as recited in claim 1, wherein the transverse force-absorbing guide element includes a guide opening in the second connection structure and a guide bolt attached to the first connection structure and extending in the direction of movement, the guide bolt being moveable along with the first connection structure in the direction of movement and engaging the guide opening.

11. The connection device as recited in claim 1, wherein the transverse force-absorbing guide element includes at least one spring element disposed between the first and second connection structures and attached to at least one of the first and second connection structures, the spring element being compressible in the direction of movement and being highly loadable and having shear rigidity in a direction transverse to the direction of movement.

12. The connection device as recited in claim 11, wherein the spring element includes at least two concentric ring elements and at least three webs distributed evenly distributed around the ring elements and connecting the at least two concentric ring elements to each other, each of the at least two concentric ring elements having a different diameter and being disposed at a distance

from the other ring element in the direction of movement, the at least three webs being slanted with respect to a transverse direction by an angle (α).

13. The connection device as recited in claim 1, wherein the transverse force-absorbing guide element has a quasi-isotropic transverse stiffness.

14. The connection device as recited in claim 1, wherein the guiding mechanism includes a transverse force-absorbing guide path, at least one of the first and second connection structure being guided along the guide path in the direction of movement while being supported in the transverse direction.

15. The connection device as recited in claim 1, wherein at least one of the transverse force-absorbing guide element, the first connection structure, and the second connection structure includes positioning portion for positioning the sacrificial element.

16. The connection device as recited in claim 15, wherein the positioning portion is for centering the sacrificial element.

17. The connection device as recited in claim 1, further comprising at least one torsional strain element configured to inhibit a torsional strain of the sacrificial element.

18. A rotary wing aircraft, comprising at least one impact-absorbing, load-limiting connection device as recited in claim 1.

19. The rotary wing aircraft as recited in claim 18, wherein the rotary wing aircraft is a helicopter.

20. The rotary-wing aircraft as recited in claim 18, further comprising a cabin and an engine, and wherein the at least one impact-absorbing, load limiting connection device is disposed between the cabin and the engine.